Department of Natural Resources and Environmental Control

Division of Air Quality

Regulation Proposal

7 DE Admin Code 1124, Section 33.0 – *Solvent Cleaning and Drying*

Technical Support Document

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1. EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) has designated certain areas of Delaware in non-attainment of the federal standard for ground-level ozone. Ground-level ozone is formed through the reaction of volatile organic compounds (VOC) and other compounds in the air in the presence of sunlight. High levels of ground-level ozone can cause or worsen difficulty in breathing, asthma and other serious respiratory problems.

The Division of Air Quality (AQ) of the Department of Natural Resources and Environmental Control (DNREC) is proposing to amend 7 **DE Admin. Code** 1124, Control of Volatile Organic Compound Emissions, Section 33.0 "Solvent Cleaning and Drying". These amendments will reduce emissions of volatile organic compounds from solvent cleaning operations.

Delaware's current regulation for solvent cleaning was last amended November 1, 2001. It was based upon a 2001 model rule developed by the Ozone Transport Commission (OTC), a group authorized by the 1990 Clean Air Act, of which Delaware is a member. The purpose of the OTC is to develop and implement regional solutions to the ground-level ozone problem in the Northeast and Mid-Atlantic regions.

The 2001 OTC Model Rule has a low vapor pressure VOC limit of less than 1.0 mm Hg vapor pressure for solvent in cold cleaning machines to control the level of VOC emissions, while still allowing for the use of 100% VOC solvent in cold cleaning machines. The OTC developed a new Solvent Cleaning Model Rule in 2012 to further reduce emission of VOC to assist OTC entities in achieving ground-level ozone standards. The 2012 OTC Model Rule specifies a more stringent limit of 25 grams of VOC per liter for cold cleaning machines.

The proposed amendments to 7 **DE Admin. Code** 1124, Control of Volatile Organic Compound Emissions, Section 33.0 "Solvent Cleaning and Drying" are based upon the new 2012 OTC Model Rule.

The proposed amendments include:

(1) eliminating the exemption for cold cleaning machines containing less than one liter of solvent and five weight percent VOC,

(2) allowing cold cleaning machines to be heated to below boiling,

(3) reducing the solvent VOC concentration from 100 percent to 25 g/l of non-VOC solution for most applications,

(4) allowing higher VOC concentrations to be used in conjunction with a VOC capture and control device, and

(5) non-substantive administrative wording edits and corrections

The amendments are expected to reduce VOC emissions from solvent cleaning and drying by 110 tons per year. This proposal is necessary to reduce the generation of ground-level ozone by reducing VOC emissions and to offer Delaware citizens an increasing quality of life through reduced air pollution.

2. BACKGROUND

A. What Is Solvent Cleaning?

Solvent cleaning is the process of using solvents to remove contaminants from various plastic, metal or other substrates (surfaces). Cleaning with solvent dissolves organic substances and washes off insoluble compounds such as dirt. The use of cleaning solvents containing high concentrations of VOCs result in reactions with other compounds in ambient air in the presence of sunlight, to form ground level ozone; which has environmental impacts for air quality.

Prior to 1990, solvent cleaning operations tended to use solvents which were pure or 100 percent VOC, such as mineral spirits, kerosene or gasoline. In more recent years, there has been a transition to the use of alternative, low-VOC solvents that can clean as effectively as 100 percent VOC solvents for most applications. Section 5 provides a discussion of the present state of solvent use.

Batch cold cleaning machines include batch-loaded and immersion cold cleaning machines, remote reservoir cold cleaning machines (also known as sink-on-a-drum) and various types of spray booths, flush booths or wash stations. In addition to using a container for solvent cleaning and drying, cleaning with a VOC solvent also can be accomplished by ”hand-wiping”, where a rag or pad is wetted with a solvent to wipe a surface clean of residues to prepare the surface for application of coatings, films or to clean parts or machines. Hand-wiping is covered in other Delaware regulations[1].

Solvent cleaning and drying can be conducted either in the liquid phase or the vapor phase. In the liquid phase (cold cleaning), soiled parts are scrubbed in a sink-like device or submerged in a container (batch cold cleaning machine) for a prescribed period and then removed, drained and allowed to drip dry. Agitation, ultrasonics or solvent spray may be used to help the cleaning process. The most common type of solvent cleaning and drying in Delaware is batch cold cleaning.

When the solvent is used as a vapor, the solvent is normally contained in a heated container at the boiling point (batch vapor cleaning machine) and the vapors are contained in a zone above the boiling liquid. Parts are lowered into the vapor zone where the vapors condense on the cooler parts and drip back into the boiling liquid, carrying soils.

Liquid and vapor style solvent cleaning and drying also may be accomplished in a conveyorized in-line cleaning machine. Parts enter through a controlled portal that prevents solvent escape, pass through the liquid or vapor phase, continue through a draining and drying step and exit through the same type of controlled portal as the inlet. This type of solvent cleaning machine is more suited for mass production. The Division of Air Quality (AQ) is currently unaware of any such cleaning machine in Delaware. 7 **DE Admin. Code** 1124, Section 33.0 recognizes such machines could exist and have long included provision for such machines in the solvent cleaning and drying regulation.

[1] Section 8.0 “Handling, Storage and Disposal of Volatile Organic Compounds (VOCs)”, subsection 8.2 “Definitions” of 7 DE Admin. Code 1124, Control of Volatile Organic Compound Emissions, the definition of “Hand-wiping”.

Cold cleaning machines generally use distilled mineral spirits specifically formulated to meet the less than 1.0 mm Hg at 20°C requirement. Some users have switched to other VOC exempt solvents such as: acetone, Chemical Abstracts Services (CAS) No. 67-64-1; perchloroethylene (perc), CAS No. 127-18-4; or, parachlorobenzotrifluoride (PCBTF), CAS No. 98-56-6. These are a few of the organic (carbon-containing) chemicals EPA has deemed exempt from being considered as VOC due to their low reactivity in the formation of ground-level ozone[2]. There are several drawbacks to using some of these exempt compounds, such as the high flammability of some like acetone, the high toxicity of others like perc, or the high cost of others such as PCBTF. But for some, using such compounds may be necessary for specialized cleaning processes, such as cleaning of medical devices, narrow tubing used in electronic clean room facilities or printed circuit boards.

B. The Current Regulation.

7 **DE Admin. Code** 1124, Control of Volatile Organic Compound Emissions, Section 33.0 "Solvent Cleaning and Drying" was most recently amended November 1, 2001. The 2001 amendments replaced the existing Section 33.0 "Solvent Metal Cleaning" with language patterned after an OTC model rule (2001 OTC Model Rule) for solvent cleaning and drying machines[3].

The 2001 amendments were designed to allow Delaware to obtain additional VOC reductions needed for EPA's approval of Delaware's one-hour ozone (1979) National Ambient Air Quality Standards (NAAQS) attainment demonstration State Implementation Plan. The current Delaware regulation has a low vapor pressure VOC limit of less than 1.0 mm Hg vapor pressure for solvent in cold cleaning machines to control the level of VOC emissions. VOC emissions reductions for Delaware from implementation of the 2001 amendments are estimated to be 730 tons/year[4].

The amendments established emission limitations, required control technologies, work practice standards, and defined the compliance, notification, monitoring, recordkeeping and reporting requirements. The current regulation applies to any person who owns or operates a solvent cleaning machine[5] that "…contains more than one liter of solvent."[6], and "…uses any solvent containing volatile organic compounds in a total concentration greater than 5 % by weight as a

[2] A listing of these compounds can be found in Section 2.0 "Definitions" of 7 **DE Admin. Code** 1101 Definitions and Administrative Principles under the definition for volatile organic compounds. This list is periodically revised as the EPA determines new chemicals to add to their list and AQ updates the Delaware list.

[3] The OTC is a group composed of twelve Northeast and mid-Atlantic states plus the District of Columbia established by the Clean Air Act of 1990. Their purpose is to aid member entities in controlling the formation of ground-level ozone, also known as smog.

[4] "Control Measure Development Support Analysis of Ozone Transport Commission Model Rules" by Pechan Associates, Page 21, dated March 31, 2001.

[5] The equipment used for solvent cleaning and drying are termed "solvent cleaning machines" a term used by the EPA in their regulations and shown in subsection 8.2 "Definitions" of 7 DE Admin. Code 1138 Emission Standards for Hazardous Air Pollutants for Source Categories

[6] Section 33.0 "Solvent Cleaning and Drying" of 7 **DE Admin. Code** 1124 Control of Volatile Organic Compound Emissions, amended November 1, 2001, subsection 33.1.1.1.

cleaning or drying agent"[7]. Therefore, use of a solvent with no VOC means the user is not required to meet the provisions of 7 **DE Admin. Code** 1124, Section 33.0 "Solvent Cleaning and Drying"[8].

In addition, the current regulation requires a cleaning solution, or solvent, containing VOC with a vapor pressure less than 1.0 millimeters of mercury (mm Hg) at 20ºC[9], for batch cold cleaning machines. The current regulation states "On and after November 11, 2002, no person shall use, sell, or offer for sale for use in a cold cleaning machine any solvent with a vapor pressure of 1.0 mm Hg or greater, measured at 20ºC (68ºF) that contains volatile organic compounds."[10] This provision effectively gave users a one-year period in which to comply with the VOC limits.

Also, the current regulation defines a batch cold cleaner as one that uses unheated solvent[11]. If a container is heated to above ambient temperature, it is considered a batch vapor solvent cleaning machine. A "vapor cleaning machine" is a solvent cleaning machine that heats liquid solvent that is used as part of the cleaning or drying cycle.

3. PROPOSED AMENDMENTS

A. The 2012 OTC Model Rule and the EPA's 2006 Control Techniques Guideline.

In 2006, the EPA issued a Control Techniques Guideline (CTG) for solvent cleaning, "Control Techniques Guideline : Industrial Cleaning Solvents"[12], which proposed new VOC limits for solvent cleaning in nine "unit operations". Three of these unit operations described by EPA in the CTG[13] are covered by Delaware's Regulation 7 **DE Admin. Code** 1124, Section 33.0: Large Manufactured Components Cleaning, Parts Cleaning, and, Small Manufactured Components Cleaning. The Clean Air Act requires that entities in the Ozone Transport Region (OTR), in non-attainment of the ozone NAAQS, adopt ground-level ozone CTGs or make similar VOC reductions.

The CTG recommended, among other things, a cleaning solution VOC content of no more than 50 g/l of a non-VOC solvent such as, but not limited to, water[14]. EPA also presented, as an alternative to the 50 g/l limit for cleaning solution, using a composite vapor pressure limit of eight millimeters of mercury (8 mm Hg) at 20º C[15]. A description of, and a formula for calculating the composite vapor pressure of a solvent mixture is shown in 7 **DE Admin. Code** 1141, subsection 4.6.5[16].

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[7] ibid. subsection 33.1.1.2.
[8] While 7 DE Admin. Code 1124, subsection 1.2 of "General Provisions" states that all operations are exempted from the provisions of the regulation 1124, whose VOC emissions are not more than 15 pounds per day; subsection 1.2 also states that this exemption does not apply to solvent cleaning operations.
[9] ibid. subsection 33.3.4.
[10] ibid. 4
[11] ibid. subsection 33.2..
[12] EPA 453/R-06-001, September 2006, 290 pages.
[13] Ibid, page 3-4
[14] Ibid, page 8
[15] Ibid page 8
[16] Subsection 4.6.5 of Section 4.0 "Adhesives and Sealants" of 7 **DE Admin. Code** 1141 Limiting Emissions of Volatile Organic Compounds from Consumer and Commercial Products, (Amended April 1, 2009).

When the CTG was published, the OTC convened a group of experts, consisting of environmental personnel from member entities, to consider if a "model rule" should be prepared and what form it should take. This group suggested that a more stringent model rule than the CTG and the 2001 OTC Model Rule be prepared. California's South Coast Air Quality Management District (SCAQMD) Rule 1122[17] was used as a guide for the new Model Rule. SCAQMD Rule 1122 used a cleaning solution VOC limit of no more than 25 g/l. A more stringent approach was selected in order to assist OTC entities in attaining the Ozone NAAQS. After considerable effort the OTC 2012 Solvent Degreasing Model Rule was completed, accepted by the OTC entities, approved by the OTC Commissioners, and published on the OTC website[18].

Rule 1122 became effective in 2003. Since 2003, SCAQMD has developed a list of providers of Clean Air Solvents certified to produce solvents with 25 g/l VOC or less[19].

Some stakeholders commented regarding specific problems with the OTC proposal and each of these comments were fully reviewed. Of special note was one by several manufacturers of high-quality vapor cleaning machines. They said vapor cleaning machines would not work with a cleaning solution other than pure VOC. Upon review, the OTC group agreed and made no changes to the VOC concentration for vapor phase cleaning machines in the OTC model rule. That is, the 2012 Solvent Degreasing Model Rule was identical to the 2001 OTC Model Rule in allowing the use of any VOC concentration for vapor cleaning machines.

While developing the 2012 OTC Model Rule, it was determined that the allowance of 100% VOC solution in vapor cleaning machines would have little effect on overall emissions; as VOC emissions were determined to be no more than eight percent of all solvent cleaning machine emissions while preparing the OTC model rule for Solvent Degreasing[20]. In addition, vapor phase solvent cleaning was used mainly for cleaning very special items like long tubing used in special medical devices, clean rooms, etc. and required special techniques to ensure reliability. Also, the cleaning solvents used were made from very special solvents that were quite expensive, so emissions were generally recovered, cleaned and recycled.

While developing these proposed amendments to 7 **DE Admin. Code** 1124, Section 33.0 "Solvent Cleaning and Drying"**,** the Division of Air Quality based the changes on the 2012 OTC Solvent Degreasing model rule, the 2006 CTG: Industrial Solvent Cleaning, and the SCAQMD Rule 1122.

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[17] SCAQMD Rule 1122 "Solvent Degreasers", amended May 1, 2009. This was the SCAQMD rule used as a basis for the OTC model rule for Solvent Degreasing of 2012.
Rule 1122 was amended July 11, 1997, setting the VOC limit for cold cleaning machines at 50 g/l of cleaning solution as of January 1, 1999. Another amendment on September 21, 2001 further reduced the VOC content of cold cleaning machines to 25 g/l, effective January 1, 2003.

[18] https://otcair.org/upload/Documents/Model%20Rules/2011%20OTC%20Model%20Rule%20for%20Solvent%20Degreasing.pdf

[19] http://www.aqmd.gov/home/programs/business/business-detail?title=certified-clean-air-solvents

[20] "OTC Model Regulations for Nitrogen Oxides (NOx) and Photo-reactive Volatile Organic Compounds (VOCs), Technical Support Document, March 16, 2011, Revised August 25, 2016, page 29.

B. The Proposed Amended Section 33.0.

The Division of Air Quality prepared a Start Action Notice (SAN), Number 2019-05 which was approved by the Delaware Department of Natural Resources (DNREC) Secretary on June 18, 2019[21].

The Department held two public workshops to provide the public with outreach and education opportunities on the proposed amended regulation. The workshops were held in New Castle and Kent Counties on January 28 and 30, 2020, respectively. The information presented at the workshop are shown on the website for this action[22]. In total 39 members of the public attended the two workshops. Several comments were received after the public workshops were held. In addition to the workshop comments which are shown in Section 9 of this report, there also were a number of AQ staff revisions to the draft amendments to clarify the wording of the proposed language.

AQ mailed and emailed notices regarding the scheduling of the workshops (a little under 2000) which in turn generated several comment letters. The total comment and response activity is shown in Section 9 of this report.

The proposed amendments are related to cold cleaning machines[23] and include:

(1) eliminating the exemption for cold cleaning machines containing less than one liter of solvent and five weight percent VOC,

(2) allowing cold cleaning machines to be heated to below boiling,

(3) reducing the allowable solvent VOC concentration from 100 percent to 25 g/l of non-VOC solution for most applications,

(4) allowing higher VOC concentrations to be used in conjunction with a VOC capture and control device, and

(5) non-substantive administrative wording edits and corrections.

Table 1 provides proposed amendments made to the current regulation which resulted in the proposed amended regulation presented for publication in the November 1, 2020 Delaware Register of Regulations. Section 9 provides a discussion of the changes to the proposed regulation that were received as a result of the Public Workshops.

[21] https://dnrec.alpha.delaware.gov/events/public-hearing-solvent-cleaning-and-drying-regulations/
[22] https://dnrec.alpha.delaware.gov/air/permitting/under-development/
[23] These amendments do not substantially impact vapor cleaning. The only substantive change proposed in relation to vapor cleaning machines is added language to clarify that waste solvent containers should be labelled pursuant to Delaware's Regulations Governing Hazardous Waste (subsections 33.4.4.1 and 33.5.3.1).

Table 1: Proposed Amendments to the Current Regulation, 7 DE Admin. Code 1124, Section 33.0

Subsection(s)	Description of Change	Proposed Language
33.1	Shows the current regulation applicability is still in effect until a one-year period from the effective date of the proposed regulation. This one-year period is provided to allow time for owners or operators of existing facilities requiring significant modification to their facilities to comply, such as by changing the materials of construction of their entire cold cleaning machine system. Steel, the material used for most 100 percent solvent cold cleaning machine systems, is not usually acceptable for water-based systems due to corrosivity. The start date for new, modified or reconstructed sources is at start-up (subsection 33.1.2). This subsection also eliminates the exemptions provided in the current regulation for facilities that contain less than one liter of solvent (subsection 33.1.1.1) and uses any solvent with a VOC concentration of 5 weight percent or less (subsection 31.1.1.2).	33.1 **Applicability.** 33.1.1 The applicable provisions of Section 33.0 ~~of this regulation~~ apply to any person who owns or operates a solvent cleaning machine that meets the following criteria ~~of 33.1.1.1 and 33.1.1.2 of this regulation~~. 33.1.1.1 For up to twelve months after [insert effective date], ~~Contains~~ contains more than one liter of solvent , and, 33.1.1.2 For up to twelve months after [insert effective date], ~~Uses~~ uses any solvent containing volatile organic compounds, as defined in 7 **DE Admin. Code** 1101, in a total concentration greater than 5% by weight, as a cleaning or drying agent. 33.1.1.3 Beginning on [insert date twelve months after effective date], uses any volume of solvent containing VOC, as defined in 7 **DE Admin. Code** 1101.
33.1.3	Clarifies which hazardous air pollutants (HAPs) are or are not covered under 7 **DE Admin. Code** 1124, Section 33.0.	33.1.3 Solvent cleaning machines using the following hazardous air pollutants (HAPs) [methylene chloride (CAS No. 75-09-2); perchloroethylene (CAS No. 127-18-4); 1,1,1-trichloroethane (CAS No. 71-55-6)], are not covered by Section 33.0 but may be covered by the requirements found at 7 **DE Admin. Code** 1138, Section 8.0 "Emission Standards for Halogenated HAP Solvent Cleaning".
33.1.4	Clarifies that the use of the term "low-vapor pressure VOC" (LVP-VOC) as used in Section 2.0 "Consumer Products" of 7 **DE Admin. Code** 1141**,** does not apply to 7 **DE Admin Code** 1124, Section 33.0. The term LVP-VOC only has application to the products used under the Consumer Products regulation, 7 **DE Admin. Code** 1141.	33.1.4 Section 33.0 regulates VOCs used in solvent cleaning machines, except as stated above, and does not separate VOCs into categories such as a low-vapor pressure chemical compound (LVP-VOC) or mixture. LVP-VOC is a term that only applies to the Consumer Products regulation (7 **DE Admin. Code** 1141, Section 2.2 "Definitions"). Thus, any requirements relating to LVP-VOC, as stated in 7 **DE Admin. Code** 1141, do not apply to Section 33.0 of this regulation.
3.2	"Definitions", the following six definitions were added: Batch cold cleaning machine; Freeboard refrigeration device; Idling mode; In-line cold cleaning machine; Lip exhaust; and, Solvent.	**"Batch cold cleaning machine"** means a batch operated cleaning machine that is designed to contain a liquid solvent or cleaning solution, has a solvent/air interface, and is always operated at a temperature below the boiling point of the cleaning solution. Batch cold cleaning machine includes batch-loaded and immersion cold cleaning machines, remote reservoir cold cleaning machines (also known as sink-on-a-drum) and various types of spray booths, flush booths or wash stations. "**Freeboard refrigeration device**" means a set of secondary coils mounted in the freeboard area of a solvent cleaning machine that carries a refrigerant or other chilled substance to provide a chilled air blanket above the solvent vapor. A primary condenser which is capable of maintaining a temperature in the center of the

		chilled air blanket at not more than 30 percent of the solvent boiling point is both a primary condenser and a freeboard refrigeration device. **"Idling mode"** means the time period when a solvent cleaning machine is turned on but is not actively processing parts. **"In-line cold cleaning machine"** means a cold cleaning machine that uses an automated parts handling system, typically a conveyor, to automatically provide a continuous supply of parts to be cleaned or dried. These units are fully enclosed except for the conveyor inlet and exit portals. **"Lip exhaust"** means a system which collects solvent vapors escaping from the top of a solvent cleaning machine and directs them away from operating personnel. **"Solvent"** means any liquid containing volatile organic compounds (VOC) which is used to perform solvent cleaning or drying.
3.2	Four Definitions had minor revisions: Cold cleaning machine, Freeboard height, Remote reservoir cold cleaning machine, and Soils.	"**Cold cleaning machine**" means a solvent cleaning machine that contains or uses ~~unheated~~ a non-boiling liquid solvent into which parts are placed to remove soils from the surfaces of the parts or to dry the parts. Cold cleaning machine does not include machines that do not have a solvent/air interface, such as airless cleaning systems and airtight cleaning systems. "**Freeboard height**" means, for a batch cold cleaning machine, the distance from the liquid solvent level to the ~~top~~ lip of the solvent cleaning machine. For a batch vapor cleaning machine, it is the distance from the solvent/air interface to the ~~top~~ lip of the solvent cleaning machine, as measured during idling mode. For an in-line cleaning machine, it is the distance from the solvent/air interface to the bottom of the entrance or exit opening, whichever is lower, as measured during idling mode. "**Remote reservoir cold cleaning machine**" means a solvent cleaning machine in which liquid solvent is pumped to a sink-like work area that immediately drains solvent back into an enclosed container while parts are being cleaned or dried, allowing no solvent to pool in the work area. A remote reservoir cold cleaning machine is also termed a sink-on-a-drum. A remote reservoir cold cleaning machine that uses an enclosed container for dipping or soaking parts is considered to be a batch-loaded, or immersion cold cleaning machine. **"Soils"** means contaminants that are removed from the parts, products, tools and machinery being cleaned. Soils include, but are not limited to, grease, oils, waxes, metal chips, carbon deposits, fluxes, and tars.
33.3.3.1, 33.4.4.1,	Clarified to show how waste solvent containers should be labelled pursuant to Delaware's Regulations Governing Hazardous Waste.	33.3.3.1 Waste solvent, still bottoms, and sump bottoms shall be collected and stored in closed containers and labeled as waste solvent, pursuant to 7 **DE Admin. Code** 1302, Delaware's Regulations Governing

33.5.3.1, and 33.6.7.1		Hazardous Waste, as applicable. The closed containers may contain a device that allows pressure relief, but does not allow liquid solvent to drain from the container.
33.3.3.3	Revised to allow higher pressures than 10 pounds per square inch gauge (psig) in the flushing device, if the device is contained in a fully enclosed system, like a flush booth which will contain any overspray. This allows users with difficult to clean large objects (like printing press parts), that could not be cleaned properly in a typical cold cleaning machine, to be cleaned.	33.3.3.3 Flushing of parts using a ~~flexible hose or other~~ flushing device such as a flexible hose shall be performed only within the freeboard area of the cold cleaning machine. The solvent flushing shall be a solid fluid stream, not an atomized or shower spray, at a pressure that does not exceed 10 pounds per square inch gauge (psig) unless the flushing device is contained within a fully enclosed designed system, such as a flush booth which contains the overspray.
33.3.3.9	Added to provide for a temperature control device on a now heated cold cleaning machine. The control device is to maintain the proper temperature for cleaning and prevent overheating and boiling which would increase VOC losses.	33.3.3.9 If heated, the cold cleaning machine shall have a temperature control device that will avoid overheating and prevent boiling of the cleaning solution. The temperature control device shall be operated and maintained in accordance with manufacturer's recommendations.
33.3.3.10	Added requirements for leak detection and repair, based on the OTC model rule.	33.3.3.10 Cold cleaning machine container or containers shall be free of all liquid leaks. Auxiliary equipment such as pumps, water separators, steam traps, or distillation units, shall not have any liquid leaks, visible tears, or cracks. In addition, any liquid leak, visible tear, or crack detected shall be repaired immediately, or isolated such that no further leak can occur, or the cleaning machine shall be drained of all solvent and shutdown until the equipment is replaced or repaired.
33.3.3.11	Added based on the OTC model rule, in reply to user concerns about how to handle a transfer of solvent into an initially empty container.	33.3.3.11 Draining or filling of solvent containers or the cold cleaning machine shall be performed beneath the solvent surface of the receiving container whenever possible to reduce splashing.
33.3.4 and 33.3.5	Revised to show there is a one-year compliance period during which the current regulation VOC limits apply for cold cleaning machines.	33.3.4 ~~On and after November 11, 2002,~~ For up to twelve months after [insert effective date], no person shall use, sell, or offer for sale for use in a cold cleaning machine any solvent with a vapor pressure of 1.0 millimeters of mercury (mm Hg) or greater, measured at 20°C (68°F) that contains volatile organic compounds. 33.3.5 ~~On and after November 11, 2002,~~ For up to twelve months after [insert effective date], a person who sells or offers for sale any solvent containing volatile organic compounds for use in a cold cleaning machine shall provide, to the purchaser, the following written information:…
33.3.6	Revised to show a Material Safety Data Sheet is now known as a Safety Data Sheet.	33.3.6 The owner or operator of a cold cleaning machine shall maintain for not less than five years, and shall provide to the Department, on request, the information specified in 33.3.5 of this regulation. An invoice, bill of sale, certificate that corresponds to a number of sales, ~~Material~~ Safety Data Sheet (~~M~~SDS), or other appropriate documentation acceptable to the Department may be used to comply with 33.0 of this regulation.
33.3.7 and 33.3.7.1	Added from the OTC model rule to show after the one-year compliance period the VOC limit for cold cleaning machine cleaning solutions would be 25 g/l except as noted in 33.3.7.2 and 33.3.7.3.	33.3.7 Beginning on [insert date twelve months after effective date], the following VOC requirements for cold cleaning machines shall apply.

		33.3.7.1 No person shall use, sell or offer for sale for use in a cold cleaning machine any solvent containing more than 25 grams of VOC per liter in a cold cleaning machine, except as noted in subsections 33.3.7.2 or 33.3.7.3. See subsection 33.10.3 for more details.
33.3.7.2	Added from the OTC model rule to show after the one-year compliance period the VOC limit for cold cleaning machine cleaning solutions for certain printed circuit boards would be 150 g/l.	33.3.7.2 Solvent to clean post-solder printed circuit boards as well as critical adjunct processes, including the cleaning of raw solder paste and adhesives from hard surfaces, such as stencils and misprinted boards during the printing process, and baked on fluxes (polymerized fluxes) from reflow and wave solder oven components, such as conveyor fingers and condensation traps, may contain no more than 150 grams VOC per liter of solution and all other applicable provisions of Section 33.0 must be followed.
33.3.7.3	Added based on the OTC model rule to show that any user could use a higher than permitted VOC content if the user employed a suitable VOC capture and control device that would reduce VOC emissions to what would be experienced if the required VOC content of 25 g/l or 150 g/l was employed. Subsection 33.11.5 provides information about the types of capture and control devices allowed.	33.3.7.3 A cold cleaning machine may use greater than the VOC content for cold cleaning machines as specified above (25 g/l or 150 g/l) by using any of the VOC capture and control devices that control VOC air emissions to no more than would be experienced if the cleaning solution were VOC compliant in absence of the capture and control device. See subsection 33.11.5 for more details.
33.4.5, 33.6.9, and 33.7.5	Added to clarify that the regulation contains no VOC content restrictions for the cleaning solvent used in: batch vapor cleaning machines, cleaning machines not having a solvent/air interface, and batch vapor or vapor in-line cleaning machines under the alternative standard.	33.4.5 VOC requirements for batch vapor cleaning machines. This regulation contains no VOC content restrictions for the cleaning solvent used in batch vapor cleaning machines. 33.6.9 VOC requirements for cleaning machines not having a solvent/air interface. This regulation contains no VOC content restrictions for the cleaning solution used in cleaning machines not having a solvent/air interface. 33.7.5 VOC requirements for alternative standard. This regulation contains no VOC content restrictions for the cleaning solvent used for batch vapor or vapor in-line cleaning machines under the alternative standard.
33.5.4	Clarify the VOC requirements for in-line cold and in-line vapor cleaning machines: in-line cold cleaning machines have the same VOC limits as other cold cleaning machines and in-line vapor cleaning machines have no VOC restrictions.	33.5.4 VOC requirements for in-line cleaning machines. 33.5.4.1 For all cold in-line cleaning machines, this regulation does contain VOC content restrictions for cleaning solution; no more than 25 grams of VOC per liter for cleaning standard parts and no more than 150 grams VOC for printed circuit boards. See subsections 33.3.7 and 33.10.3. 33.5.4.2 This regulation contains no VOC content restrictions for the cleaning solvent used in vapor in-line cleaning machines.

33.6.8.2 and 33.7.4.2	Added an incorporation by reference date for EPA test method.	33.6.8.2 Using the records of all solvent additions and deletions for the previous monthly reporting period, determine total solvent emissions, E, using Equation 33-2 ~~of this regulation~~:… SSR = the total amount of VOC solvent removed from the solvent cleaning machine in solid waste during the most recent monthly reporting period (kilograms of solvent per month), as determined from tests conducted using Method 25D in **Appendix A** of 40 CFR part 60), dated July 1, 2019 and hereby incorporated by reference or by engineering calculations included in the compliance report.
33.8.8	Fixed typo in current regulation. Added text missing in the first line: "solvent cleaning machine".	33.8.8 The owner or operator of a solvent cleaning machine using a carbon adsorber to comply with Section 33.0 ~~of this regulation~~ shall measure and record the concentration of VOC solvent in the exhaust of the carbon adsorber whenever the solvent cleaning machine is in the working mode or is venting to the carbon adsorber…
33.8.9	Added to allow the use of a "heated" cold solvent cleaning machine. Also added text to require testing of the temperature control system after repairs to the system.	33.8.9 The owner or operator of a heated cold cleaning machine described in subsection 33.3.3.9 shall perform a test of the temperature control system as provided by the manufacturer at least once per year and after any repairs to the temperature control system.
33.9.6	Added recordkeeping requirements for what records owners or operators must keep after the one-year compliance period is completed.	33.9.6 The owner or operator of a cold cleaning machine shall provide to the Department on request, the information specified in subsection 33.10.3. An invoice, bill of sale, certificate that corresponds to a number of sales, Safety Data Sheet (SDS) or other appropriate documentation acceptable to the Department may be used for compliance.
33.10.3	Added as a replacement for subsections 33.3.5 and 33.3.6, which informs users of existing cold cleaning machines requiring the one-year compliance period, regarding solvent purchase documentation after the one-year period.	33.10.3 Beginning on [insert date twelve months after effective date], obtain from any person from whom they purchase or obtain any solvent containing VOC for use in a cold cleaning machine, a document specifying the following accurate information specific to all purchased or obtained product: 33.10.3.1 The name and address of the solvent supplier. 33.10.3.2 The type of solvent including the product or vendor identification number. 33.10.3.3 The VOC content of the solvent as determined by a test method in subsection 33.11.1.
33.11	Added language in related to Test Methods which was based generally on 2012 OTC Rule and SCAQMD Rule 1122.	33.11 Test Methods 33.11.1 The VOC content of materials subject to the provisions of Section 33.0 shall be determined by the EPA Reference Method 24 (Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coatings, Code of Federal Regulations Title 40, Part 60, Appendix A-7), dated May 1, 2019 and hereby incorporated by reference,

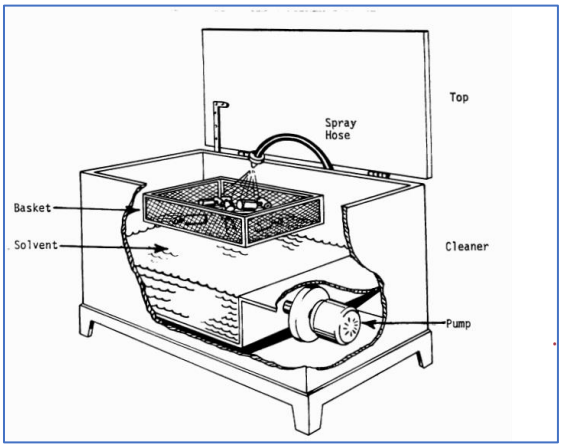
		or by SCAQMD Method 304 [Determination of Volatile Organic Compounds (VOCs) in Various Materials] contained in the SCAQMD "Laboratory Methods of Analysis for Enforcement Samples" manual, dated 1996 and hereby incorporated by reference. The VOC content of materials containing 50 g/l of VOC or less shall be determined by SCAQMD Method 313 (Determination of Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry), dated 1991 and hereby incorporated by reference or any other alternative test methods approved by the Department and by EPA. 33.11.2 When more than one test method or set of methods are specified for any testing, a violation of any requirement established by any one of the specified test methods or set of test methods shall constitute a violation of this regulation. 33.11.3 Maximum hoist speed shall be measured with use of a stop clock and distance traveled by the hoist. 33.11.4 Temperatures in the vapor zone shall be measured with the use of a temperature probe. 33.11.5 If a VOC emissions capture and control system is required or used as an alternative compliance method to comply with subsection 33.3.7.3, the procedures shown in Appendix D "Emission Capture and Destruction or Removal Efficiency and Monitoring Requirements" of 7 DE Admin. Code 1124 and Appendix E "Determining the Destruction or Removal Efficiency of a Control Device" of 7 DE Admin. Code 1124 shall be followed.
33.12	Added to alert readers how to obtain copies of the SCAQMD rules mentioned in subsection 33.11.1.	33.12 Test Method Availability SCAQMD methods described in subsection 33.11.1 can be purchased from South Coast Air Quality Management District, located in California.

4. TYPES OF COLD CLEANING MACHINES

Cold cleaning machine operations include spraying, brushing, flushing, and immersion. In a typical maintenance cleaning machine, dirty parts are cleaned manually by spraying and then soaking in the container. After cleaning, the parts are either suspended over the container to drain or are placed on an external rack that routes the drained solvent back into the cleaning machine. The cover is intended to be closed whenever parts are not being handled.

Typical manufacturing cold cleaning machines vary widely in design. There are three basic types: the batch, or immersion, cold cleaning machine (Figure 1); the simple remote reservoir cold cleaning machine (Figure 2); and the flush or spray booth (Figure 3). Of these, the batch or immersion type provides more thorough cleaning through immersion, and often is made to improve cleaning efficiency by agitation. Small cold cleaning machines may be numerous in urban areas. However, because of the small quantity of emissions from each operation, the large number of individual sources within an urban area, and the application of small cold cleaning machines to industrial uses, it is difficult to identify individual small cold cleaning operations.

Figure 1: Batch Cold Cleaning Machine

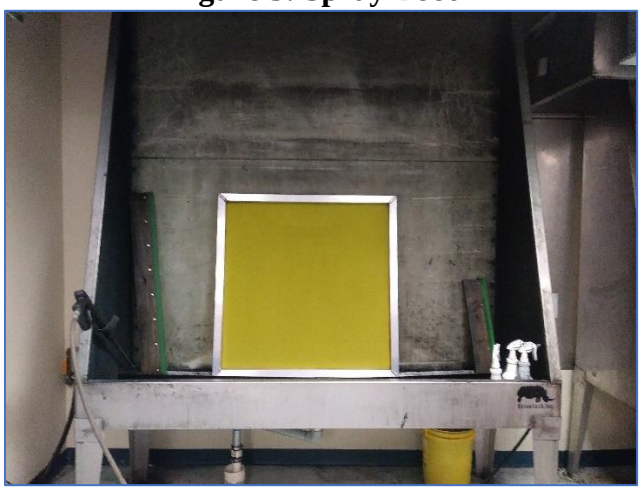


Source: EPA-450/2-77-002

Figure 2: Remote Reservoir Cold Cleaning Machine

Source: TP Tools & Equipment

Figure 3: Spray Booth



Source: Delaware Department of Transportation

Most cold cleaning machines consist of a container of some sort, with a lid or cover. It may be agitated and it may be heated, with the cleaning solution always kept below the boiling point. The proposed amendments to 7 **DE Admin. Code** 1124, Section 33.0 remove the exemption in the current regulation for containers with one liter or less of cleaning solution and solvents containing 5 weight percent or less of VOC. Cold cleaning machines with any VOC content (25 g/l or less, or 150 g/l or less for printed circuit board cleaning) and of any size are regulated by these amendments. Buckets, pails, beakers and coffee cans are all considered as cold cleaning machines and are regulated.

5. PRESENT STATE OF SOLVENT USE

A. Low-VOC Solvent Studies

California and the EPA have helped the transition to lower VOC solvents by contracting with outside groups to research ways in which to accomplish cleaning of routine and special parts using water-based systems. The benefits to businesses of using water based solvents can included: lower cost; worker safety; benefit to the environment; and extended solvent life[24]. More information about major low VOC solvent studies is shown below:

- The Bay Area Pollution Prevention Group contracted with the Institute for Research and Technical Assistance (IRTA), to study using water-based cleaners as opposed to mineral spirits for parts cleaning. IRTA developed an 8-page brochure for distribution that showed the advantages of using a water-based system, which included: lower costs and worker safety[25].

[24] "Case Studies in Aqueous Parts Cleaning, Best Environmental Practices for Auto Repair Shops", November 2001.
[25] "Switching to Water-Based Cleaners in Repair and Maintenance Parts Cleaning" Institute for Research and Technical Assistance (IRTA), Dr. Katy Wolf and Mike Morris, February 1999.

- SCAQMD contracted with IRTA in 2003 to study the low-VOC systems for their companion rule to Rule 1122, Rule 1171 "Solvent Cleaning Operations"[26]. In the course of this project, IRTA focused on finding low VOC solvent alternatives in three cleaning categories including:
    - electronics and high technology cleaning applications
    - coating and adhesive spray equipment cleaning
    - screen and specialty flexographic ink cleanup

  This study is referenced because Delaware includes cleaning of screens used in screen printing, for example tee shirts, signage, etc., and cleaning press parts removed from printing presses in 7 **DE Admin. Code** 1124, Section 33.0 "Solvent Cleaning and Drying". This type of cleaning is handled in SCAQMD Rule 1171 and was included in DE 7 **DE Admin. Code** 1124, Section 8.0 "Handling, Storage, and Disposal of Volatile Organic Compounds (VOCs)", but now is included in the amended regulation.

- Cal/EPA's Department of Toxic Substances Control (DTSC) and EPA Region IX sponsored a study of low-VOC, low toxicity solvents for the screen printing industry in 2005[27]. IRTA worked with nine screen printers in southern California to find low VOC solvent alternatives that performed effectively for the screen printing industry and were cost effective.

- EPA Region IX sponsored a study report by IRTA on safer alternatives in cleaning and thinning operations[28]. This document includes information regarding cold solvent cleaning, printing press cleaning (of parts removed from presses, not cleaning solutions for blanket and roller wash which are the subject of other regulations), and screen printing screen cleaning. IRTA identified low VOC solvent alternatives that performed effectively for the printing press and screen printing industries and were cost effective.

B. Solvent Options

In choosing a solvent to use, one choice is to use an exempt solvent. That is, an organic chemical compound that is not considered a VOC by EPA (and also by Delaware[29]), as pointed out in an earlier part of this document. Some of these non-VOC solvents are more flammable, more toxic,

[26] "Assessment, Development and Demonstration of Low-VOC Cleaning Systems for the South Coast Air Quality Management District Rule 1171", Mike Morris and Katy Wolf, Institute for Research and Technical Assistance, August 2003.
[27] "Alternative Low-VOC, Low Toxicity Solvents for The Screen Printing Industry", by Mike Morris and Katy Wolf (IRTA), April 2005.
[28] "Tertiary-Butyl Acetate: Safer Alternatives in Cleaning and Thinning Operations", by Katy Wolf (IRTA), March 2007.
[29] Section 2.0 "Definitions" of 7 **DE Admin. Code** 1101 Definitions and Administrative Principles, amended January 1, 2019, under the definition for "Volatile organic compounds".

more expensive, and otherwise regulated as ozone depleting substances or greenhouse gases (GHG); but the EPA has helped in this regard by adding considerably more organic compounds to the list of compounds not considered as VOC.

Water-based cleaning solutions dissolve contaminants or react with contaminants and make them more readily soluble in water. For example, some materials will react with or dissolve more readily in an acidic solution (pH of 7 or lower). Other materials will react with or dissolve more readily in an alkaline solution (pH above 7). Water-based cleaning solutions can contain other components to improve the cleaning activity. These other materials can include: surfactants; emulsifiers; saponifiers; sequestering agents and chelating agents.

For precision cleaning or the cleaning of materials like optics, the parts must be scrupulously clean and if water-based cleaning solutions with additives are used, the parts may often need rinsing with pure water to remove these materials. One can use ultrasonic agitation to improve the efficacy of water-based solvents with 25 grams VOC per liter, perhaps further improved by heating without resort to other additives and not require a rinsing step. Fortunately, most of the cold cleaning machines in use in Delaware are for repair and maintenance and do not require parts cleaned to the level of precision cleaning.

C. Affect of Aqueous Based Solutions on Steel Cold Cleaning Machines

One of the more challenging aspects of the use of water-based chemistries is that most cold cleaning machines using 100 percent VOC are made of steel. This includes the pumps, piping and other ancillary equipment. Water-based systems, especially when heated, may require other materials of construction,(stainless steel, plastic or glass-lined steel) due to corrosivity. There may be some coatings that could be used on certain systems that use certain water-based chemistries that are less corrosive. Those intending to use a certain cleaning solution system provider should determine the materials of construction required.

Some companies provide a service whereby they provide a user with a cold cleaning machine system (owned by the provider) for a certain cleaning procedure and will come at proscribed intervals to remove the spent cleaning solution, add fresh cleaning solution and dispose of the spent solution properly. Since these services own the cold cleaning machine, they prefer the cold cleaning machine is reusable in other locations if it is no longer needed. This is one of the reasons Delaware provides a one-year period for existing users of a cold cleaning machine to comply (the compliance period).

6. ECONOMIC IMPACT

Although some Delaware users of liquid phase solvent cleaning machines are large companies, such as major automobile dealers, the refinery and Dover Air Force Base, many are small service and manufacturing companies.

Existing facilities may need to purchase new equipment more compatible with aqueous, low-VOC cleaning solutions. Facilities may be able to offset equipment costs by selling their old, incompatible equipment. Also, part of these additional costs can be counteracted by using new lower VOC solutions, which can be less expensive to obtain and dispose. Facilities that were previously exempted under the current regulation, will be required to keep and report a small

amount of additional information. This information will include an invoice, bill of sale, certificate that corresponds to a number of sales, Safety Data Sheet (SDS) or other appropriate documentation acceptable to the Department may be used for compliance with the 25 grams VOC per liter limit. A more detailed analysis of potential costs is shown below.

COST ANALYSES

Annualized Cost Savings - Switching From 100% VOC to 50 g/l – CTG

The 2006 CTG presents annualized 2006 costs for operating with 100% VOC cleaners vs. 50 g/l cleaners. In relation to costs, the CTG found that "...there is a cost saving associated with replacing high-VOC cleaning materials with low-VOC, water-based cleaning materials...".

Costs associated with switching from high-VOC cleaners to aqueous, or low-VOC cleaners include: the initial cost of equipment amortized over a 10-year life, solvent costs, filters, electricity, and waste disposal costs. Many of these costs are also incurred when operating ~~h~~high-VOC solvent cleaners. While it can cost more to dispose of low-VOC cleaners, this can be offset by the lower cost of some low-VOC solutions. Users that switch from 100% VOC to 50 g/l may be required to replace cold cleaning machines to accommodate the use of aqueous based solutions, as these solutions will corrode oil-based cold cleaning machines. A study on parts cleaners has shown typical 2006 annualized costs for 100% VOC parts cleaners as $1,453[30]. Estimates of annualized costs for ~~l~~ow-VOC parts cleaners, in comparison, range from $1,171 to $1,480, as shown in the table below.

Since the proposed compliance year will be 2022, the 2006 annualized cost savings data must be adjusted for inflation in 2022. The increase in inflation from 2006 to 2022 can be determined by adjusting the 2006 CTG information above by the Consumer Price Index (CPI) between 2006 and 2020, and then adding an inflationary increase of 2 percent per year from 2020 until the 2022 compliance date. Estimated annualized costs for high-VOC cleaners increase to $1,976 per year. Estimated annualized low-VOC cleaners increase to a range of $1,595-$2,013. Estimated annualized cost savings for switching from a high-VOC cleaner to a low-VOC cleaner are shown for 2006 and 2022 in the table below:

Table 2: Annualized Costs for Cold Solvent Cleaners

ANNUALIZED COSTS for COLD SOLVENT CLEANERS				
Year	**High-VOC Cleaner**	**Low-VOC Cleaner**	**Annualized Cost Savings High-VOC vs Low-VOC Cleaners**	
			Lower Estimate	**Upper Estimate**
2006	$1,453	$1,171-$1,480	$282	-$27
2022	$1,976	$1,595-$2,013	$383	-$37

[30] Bay Area Air Quality Management District, Staff Report: Proposed Amendments to BAAQMD Regulation 8, Rule 16: Solvent Cleaning Operations, September 2002.

Annualized Cost Savings - Using 25 Grams VOC/Liter Instead of 50 g/l

The proposed amended Delaware regulation is more stringent than the CTG and requires the use of 25 grams VOC per liter of cleaning solution. There are minimal cost differences between the use of 50 g/l (as analyzed above) and 25 g/l solutions.

The primary cost in switching from a 100% cleaner to a 50 g/l cleaner is the cost of a new cold cleaning machine to accommodate the use of more corrosive aqueous based solutions. Both 50 g/l and 25 g/l solutions contain water; therefore, this change would not require users to purchase a different cleaning machine.

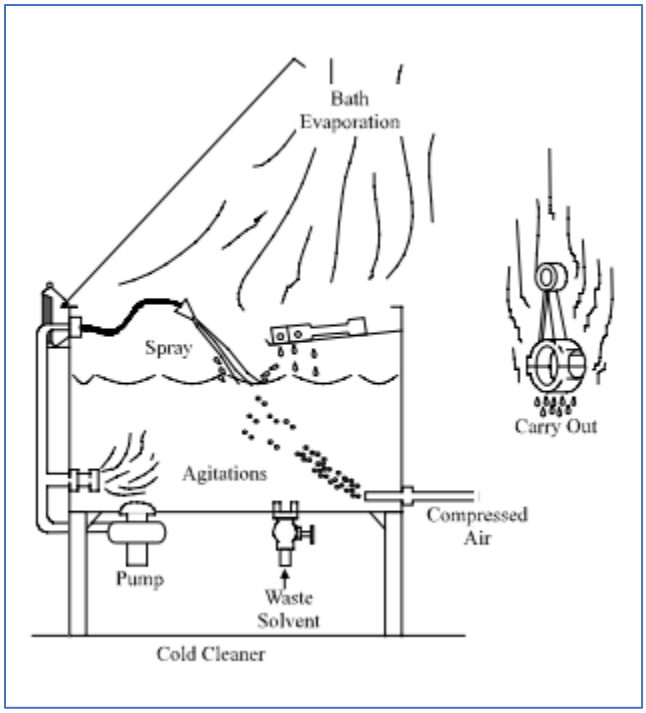
It is possible that 50g/l solutions could be diluted to meet the 25g/l limit and still adequately meet the users cleaning requirements. Therefore, the switch from 50 g/l to 25 g/l solution would not cause a substantial increase in operational costs. In fact, the overall cost of purchasing, using and disposing of a 25 g/l VOC containing cleaning solution could be slightly lower, since less VOC would be used.

There are many lower VOC cleaners commercially available. SCAQMD has a website devoted to listing manufacturers of certified low-VOC cleaning solutions, which currently contains 97 products from 38 manufacturers (SCAQMD Rule 1122 requires the use of 25 g/l solution).

7. PROJECTED VOC EMISSION REDUCTIONS

Emissions from cold cleaning machines occur through: (1) waste solvent evaporation, (2) solvent carryout (evaporation from wet parts), (3) solvent bath evaporation, (4) spray evaporation, and (5) agitation (Figure 4). Waste solvent loss, formerly a high VOC loss contributor, is reduced somewhat by using a lower concentration of VOC in the cleaning solution. Draining cleaned parts for at least 15 seconds reduces carryout emissions. Cold cleaning machine evaporation can be controlled by using a cover regularly, by allowing an adequate freeboard height, and by avoiding excessive drafts in the workshop. Agitation emissions can be controlled by using a cover, by agitating no longer than necessary, and by avoiding the use of agitation with low volatility solvents. Emissions of low volatility solvents increase significantly with agitation. Solvent type is the variable that most affects cold cleaning machine emission rates, particularly the volatility at operating temperatures.

Figure 4: Cold Solvent Cleaner Emission Points



Source: EPA AP-42 Solvent Cleaning

Emission rates are usually estimated from solvent consumption data for the particular solvent cleaning and drying operation under consideration[31].

As mentioned earlier in this report, VOC emissions from vapor phase solvent cleaning are estimated to amount to approximately eight percent of all VOC emissions from solvent cleaning and drying" and are considered as a small fraction of overall VOC emissions[32]. Since provisions for vapor phase cleaners have not substantively changed, all VOC emission reductions are derived from cold cleaning machines.

The OTC calculated a VOC reduction of 1.2 tons per day for the emissions remaining after the 2001 iteration of the solvent cleaning and drying regulation was calculated for Delaware amending the 2001 regulation [33, 34].

[31] "EPA Technology Transfer Network Clearinghouse for Inventories & Emissions Factors", "Emission Inventory Improvement Program", Volume 3, "Area Sources", Chapter 1 "Introduction to Area Source Emission Inventory Development", April 2001, Section 3.2 "Material Balance Method", page 1.3-5.
[32] "OTC Model Regulations for Nitrogen Oxides (NOx) and Photo-reactive Volatile Organic Compounds (VOCs), Technical Support Document", March 16, 2011, Revised August 25, 2016, page 29.
[33] Ibid.
[34] "Control Measure Development Support Analysis of Ozone Transport Commission Model Rules" by Pechan Associates, Page 21, dated March 31, 2001.

However, consultation with Air Quality staff in 2020, revealed that the estimated VOC emission reductions are anticipated to be up to 110 tons per year as a result of updates to the calculation methodology.

8. STAKEHOLDER PARTICIPATION

To identify sources potentially affected by the proposed amendments, AQ used several methods:

A. NAICS Codes

AQ staff used Department of Labor (DOL) information on the 2018 North American Industry Classification System (NAICS) in Delaware related to solvent cleaning and drying to identify potential sources. The NAICS, developed in cooperation with Canada and Mexico, replaces the Standard Industrial Classification (SIC) used earlier. NAICS uses a production-oriented framework to group establishments into industries. Establishments using similar raw material inputs, similar capital equipment, and similar labor are classified in the same industry.

These codes were reviewed and only those with a direct relation to performing or supplying goods to perform solvent cleaning and drying in Delaware were selected to form a list of stakeholders. Others were confirmed by inspection (known stakeholders) or checking other entries on the list through online search engines like Google. Organizations supplying cold cleaning machines and those supplying cleaning solutions were predominately located in other states. Organizations performing solvent cleaning and drying were located within Delaware.

B. Additional Facilities and Groups Contacted

AQ staff also obtained a list of permitted sources for cold cleaning machines in Delaware from the Division's Engineering and Compliance Section. In addition, since mobile equipment refinishing shops often used cold cleaning machines, AQ staff obtained a list of those facilities from the Division's Area Sources Program responsible for such.

The above methods resulted in a master list of approximately 1,800 Delaware facilities possibly using cold cleaning machines and suppliers vending equipment, services or cleaning solutions for solvent cleaning activities in Delaware.

AQ staff then sent an information letter and/or an email to the identified sources informing them of our program, and the Division's "Regulations and Plans Under Development" website[35] which contained some of the documents such as the draft regulation Section 33.0 of 7 **DE Admin. Code** 1124, the Appendices of 7 **DE Admin. Code** 1124, the current regulation Section 33.0 of 7 **DE Admin. Code** 1124 (amended November 1, 2001), the CTG, the SCAQMD Rule 1122, 7 DE **Admin. Code** 1101 Definitions and Administrative Principles, and, the OTC Solvent Degreasing Model Rule 2012. They were also invited to attend one of the two Public Workshops scheduled for late January.

[35] https://dnrec.alpha.delaware.gov/air/permitting/under-development/

9. PUBLIC PARTICIPATION

A Review Committee was not held regarding the amendments to 7 **DE Admin. Code** 1124, Section 33.0; as we believed the workshops sufficed for educating the public and the affected regulated community on the impact of these proposed amendments.

After the Start Action Notice was issued in 2019, an interested persons email was sent to over 50 groups and organizations likely to have interest in Delaware solvent cleaning and drying. Interested persons included: the Delaware Chamber of Commerce; Green DE; The Nature Conservancy, Delaware Chapter; Sierra Club, Delaware Chapter; American Lung Association, Delaware Chapter; and, The League of Women Voters, Delaware Chapter. This email transmitted information about the recently signed SAN and alerted recipients to the website. At that time the draft regulation was still incomplete and required additional work by AQ staff.

Resulting from the email to the 50 groups and organizations, AQ staff received a request from the Delaware Automotive Service Professionals (DASP) to present information about this program at one of their meetings. A meeting was scheduled for the evening of September 26, 2019. Fourteen members of the public attended and AQ staff gained information concerning auto repair and solvent cleaning activities. One member recounted a recent switch to a nationally known cold cleaning machine product that used a brand of cleaning solution on the SCAQMD Certified Clean Air Solvents[36] list that was VOC free. It was accomplished with no difficulty and essentially rolled into place and started cleaning parts.

The Department held two public workshops to provide the public with outreach and education opportunities on the proposed amended regulation. The meetings were held in New Castle and Kent Counties on January 28 and 30, 2020, respectively. Attendees at the workshop and interested parties not attending were asked to submit comments concerning the draft regulation by February 14, 2020. AQ staff received comments from five stakeholders.

It became evident soon after that AQ had not adequately contacted certain printers who used flush booths to clean parts removed from printing machinery. AQ staff subsequently developed a list of thirteen representatives and emailed them about the workshops, including where they could find copies of the presentations. The comment period was extended to provide these additional stakeholders to submit comments. A few responded, but did not comment.

Comments received were considered, as presented by Table 3. Edits made to the proposed language by the Division for clarification purposes are shown in Table 3 below. Responses to public comments are shown in Table 4 below. The table shows how the draft regulation presented in the workshop was modified to provide the proposed regulatory language that was published by the Delaware Registrar on November 1, 2020.

[36] http://www.aqmd.gov/home/programs/business/business-detail?title=certified-clean-air-solvents

Table 3: Summary of Division of Air Quality Edits to Proposed Workshop Language

Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
3.1	Clarify applicability language.	Revised applicability language so that it was clearer that existing affected sources have 12 months before the 1L volume and % weight applicability restrictions will be removed, for existing sources.	**33.1 Applicability.** 33.1.1 The applicable provisions of Section 33.0 ~~of this regulation~~ apply to any person who owns or operates a solvent cleaning machine that ~~meets the criteria of 33.1.1.1 and 33.1.1.2 of this regulation.~~ contains any amount of volatile organic compound (VOC) material. ~~**33.1.1.1** Contains more than one liter of solvent.~~ ~~**33.1.1.2** Uses any solvent containing volatile organic compounds in a total concentration greater than 5% by weight, as a cleaning or drying agent.~~ **33.1.2** ~~Except as provided in 33.3.4 through 33.3.6 of this regulation, existing sources affected permitted by 33.0 of this regulation shall comply with the provisions of 33.0 of this regulation no later than November 11, 2001.~~ New, modified, or reconstructed sources affected by Section 33.0 ~~of this regulation~~ shall comply with the provisions of Section 33.0 ~~of this~~ ~~regulation~~ upon start-up.	**33.1 Applicability.** 33.1.1 The applicable provisions of Section 33.0 ~~of this regulation~~ apply to any person who owns or operates a solvent cleaning machine that meets the following criteria ~~of 33.1.1.1 and 33.1.1.2 of this regulation~~. **33.1.1.1** For up to twelve months after [insert effective date], ~~Contains~~ contains more than one liter of solvent, and, **33.1.1.2** For up to twelve months after [insert effective date], ~~Uses~~ uses any solvent containing volatile organic compounds, as defined in 7 **DE Admin. Code** 1101, in a total concentration greater than 5% by weight, as a cleaning or drying agent. **33.1.1.3** Beginning on [insert date twelve months after effective date], uses any volume of solvent containing VOC, as defined in 7 **DE Admin. Code** 1101. **33.1.2** ~~Except as provided in 33.3.4 through 33.3.6 of this regulation, existing sources affected by 33.0 of this regulation shall comply with the provisions of 33.0 of this regulation no later than November 11, 2001.~~ New, modified, or reconstructed sources affected by Section 33.0 ~~of this regulation~~ shall comply with the provisions of Section 33.0 ~~of this~~ ~~regulation~~ upon start-up.
33.4.4.11	Missing additional language to maintain consistency with Sections 33.3.3.11& 33.6.7.7 (see Table 4).	Added language.	**33.4.4.11** When solvent is added to or drained from the batch vapor cleaning machine, the solvent shall be transferred using threaded or other leak-proof couplings, and the discharge end of the pipe shall be located beneath the liquid solvent surface.	**33.4.4.11** When solvent is added to or drained from the batch vapor cleaning machine, the solvent shall be transferred using threaded or other leak-proof couplings, and the discharge end of the pipe shall be located beneath the liquid solvent surface of the receiving container whenever possible to reduce splashing.
33.5.3.13	Typo.	In the current regulation the term “on-line” is used instead of “in-line”.	**33.5.3.13** If a lip exhaust is used on the on-line cleaning machine, the ventilation rate shall not exceed 20 m3/min/m2 (65 ft3/min/ft2) of on-line cleaning machine open area, unless a higher rate is necessary to meet OSHA requirements.	**33.5.3.13** If a lip exhaust is used on the ~~on-line~~ in-line cleaning machine, the ventilation rate shall not exceed 20m3/min/m2 (65 ft3/min/ft2) of ~~on-line~~ in-line cleaning machine open area, unless a higher rate is necessary to meet OSHA requirements.

Table 4: Summary of Public Comments Received from January 8, 2020 and February 19, 2020, and the Actions Taken Following These Comments. (Yellow highlights are changes made based on comments received)

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
Safety-Kleen	2/13/2020	33.1.1	Requests that users of 2.5 wt % cleaning solutions (or less) be exempted from the amended regulation.	**The Department made no changes based on the received comment.** This was not the intent of the amended regulation. An exemption for users of 2.5 wt % cleaning solutions or less would result in increased VOC emissions, decreasing the overall effectiveness of the proposed rule.	**33.1.1** The applicable provisions of Section 33.0 ~~of this regulation~~ apply to any person who owns or operates a solvent cleaning machine that ~~meets the criteria of 33.1.1.1 and 33.1.1.2 of this regulation.~~ contains any amount of volatile organic compound (VOC) material. ~~33.1.1.1 Contains more than one liter of solvent.~~ ~~33.1.1.2 Uses any solvent containing volatile organic compounds in a total concentration greater than 5% by weight, as a cleaning or drying agent.~~	N/A
Printpack	2/13/2020	33.1.3	Requests a time frame for updating permits be shown, 90 days should be allowed for Title V permits.	**The Department made no changes based on the received comment.** The Department believes it is incumbent on the user to initiate a request to revise a permit promptly. Title V permits have a proscribed process and timing for permit renewal and amendment.	N/A	N/A
Printpack	2/13/20	33.2	Need a definition of a "Batch cold cleaning machine"	Added a standalone definition for "batch cold cleaning machine". Moved language from definition for "Cold cleaning machine" to "Batch cold cleaning machine" definition.	**33.2 "Cold cleaning machine"** means a solvent cleaning machine that contains or uses ~~unheated~~ a non-boiling liquid solvent into which parts are placed to remove soils from the surfaces of the parts or to dry the parts. Cold cleaning machines include, but are not limited to, batch cold cleaners and conveyorized in-line cold cleaners. Batch-loaded cold cleaners, immersion cold cleaning machines, remote reservoir cleaners (also known as sink-on-a-drum), and various types of spray booths, flush booths or wash stations are all various types of batch cold cleaners. Cold cleaning machine does not include machines that do not have a solvent/air interface, such as airless cleaning systems and airtight cleaning systems.	**33.2 "Batch cold cleaning machine"** means a batch operated cleaning machine that is designed to contain a liquid solvent or cleaning solution, has a solvent/air interface, and is always operated at a temperature below the boiling point of the cleaning solution. Batch cold cleaning machine includes batch-loaded and immersion cold cleaning machines, remote reservoir cold cleaning machines (also known as sink-on-a-drum) and various types of spray booths, flush booths or wash stations. **33.2** "**Cold cleaning machine**" means a solvent cleaning machine that contains or uses ~~unheated~~ a non-boiling liquid solvent into which parts are placed to remove soils from the surfaces of the parts or to dry the parts. Cold cleaning machine does not include machines that do not have a solvent/air interface, such as airless cleaning systems and airtight cleaning systems.

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
EPA Region 3	2/19/2020	33.2	Need a definition for "Freeboard refrigeration device"	Added a definition for "Freeboard refrigeration device"	N/A	**33.2 "Freeboard refrigeration device"** means a set of secondary coils mounted in the freeboard area of a solvent cleaning machine that carries a refrigerant or other chilled substance to provide a chilled air blanket above the solvent vapor. A primary condenser which is capable of maintaining a temperature in the center of the chilled air blanket at not more than 30 percent of the solvent boiling point is both a primary condenser and a freeboard refrigeration device.
EPA Region 3	2/19/2020	33.2	Questioned why 24 definitions in the OTC model rule were not used in the amended regulation.	**The Department made no changes based on the received comment.** The Division used the OTC model rule as a guide, but did not include all of the exact wording and definitions in its proposed rule. Therefore, some of the definitions EPA Region 3 identified were not applicable to Delaware's proposed rule. Also, several definitions were already included in the proposed rule, but had slightly different titles than comparative definitions in the OTC rule.	N/A	N/A
Printpack	2/13/2020	33.2	Draft regulation does not describe a batch cold cleaning machine as applying to a flush booth.	Added the words "and various types of spray booths, flush booths or wash stations" to the new definition of a "Batch cold cleaning machine" in Section 33.2.	N/A	**33.2 "Batch cold cleaning machine"** means a batch operated cleaning machine that is designed to contain a liquid solvent or cleaning solution, has a solvent/air interface, and is always operated at a temperature below the boiling point of the cleaning solution. Batch cold cleaning machine includes batch-loaded and immersion cold cleaning machines, remote reservoir cold cleaning machines (also known as sink-on-a-drum) and various types of spray booths, flush booths or wash stations.
Safety-Kleen	2/13/2020	33.2	Requests the term "owner or operator" be defined since some of the equipment Safety-Kleen services belongs to Safety-Kleen and some does not.	**The Department made no changes based on the received comment.** The term "owner or operator" has been in this regulation since at least 2001 and not caused confusion with leased facilities. The definition of owner or operator in Section 2.0 "Definitions" of Regulation 1124 is "means any person who owns, leases, controls, operates or supervises a facility, a source, or air pollution control or monitoring equipment".	N/A	N/A

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
Printpack	2/13/2020	33.2	Requested an automatic parts washer be defined in the amended regulation.	**The Department made no changes based on the received comment.** The Department believes the definition of a "cold cleaning machine" already covers automatic parts washers.	**33.2 "Cold cleaning machine"** means a solvent cleaning machine that contains or uses ~~unheated~~ a non-boiling liquid solvent into which parts are placed to remove soils from the surfaces of the parts or to dry the parts. Cold cleaning machines include, but are not limited to, batch cold cleaners and conveyorized in-line cold cleaners. Batch-loaded cold cleaners, immersion cold cleaning machines, remote reservoir cleaners (also known as sink-on-a-drum), and various types of spray booths, flush booths or wash stations are all various types of batch cold cleaners. Cold cleaning machine does not include machines that do not have a solvent/air interface, such as airless cleaning systems and airtight cleaning systems.	**3.2** "**Cold cleaning machine**" means a solvent cleaning machine that contains or uses ~~unheated~~ a non-boiling liquid solvent into which parts are placed to remove soils from the surfaces of the parts or to dry the parts. Cold cleaning machine does not include machines that do not have a solvent/air interface, such as airless cleaning systems and airtight cleaning systems.
Printpack	2/13/2020	33.3.3.3	Condition forbids the use of an automatic parts washer which uses high pressure spray in an enclosed system.	Added the words "unless the flushing device is contained within a fully enclosed designed system, such as a flush booth which contains the overspray" to subsection 33.3.3.3.	**33.3.3.3** Flushing of parts using a flexible hose or other flushing device shall be performed only within the freeboard area of the cold cleaning machine. The solvent flushing shall be a solid fluid stream, not an atomized or shower spray, at a pressure that does not exceed 10 pounds per square inch gauge (psig).	**33.3.3.3** Flushing of parts using a ~~flexible hose or other~~ flushing device such as a flexible hose shall be performed only within the freeboard area of the cold cleaning machine. The solvent flushing shall be a solid fluid stream, not an atomized or shower spray, at a pressure that does not exceed 10 pounds per square inch gauge (psig) unless the flushing device is contained within a fully enclosed designed system, such as a flush booth which contains the overspray.
Printpack	2/13/2020	33.3.3.9 & 33.8.9	A continuous temperature record should not be required. When a cold cleaning machine is manufactured, a simple temperature control device is included, that does not have the means of displaying or recording the temperature. The machines have temperature control devices to regulate temperature and the unit will shut down at high temp.	33.3.3.9 was changed to "If heated, the cold cleaning machine shall have a temperature control device that will avoid overheating and prevent boiling of the cleaning solution. The temperature control device shall be operated and maintained in accordance with manufacturer's recommendations. 33.8.9 was revised to "The owner or operator of a heated cold cleaning machine described in subsection 33.3.3.9 shall perform a test of the temperature control system as provided by the manufacturer at least once per year and after any repairs to the temperature control system."	**33.3.3.9** If heated, the cold cleaning machine shall have a temperature control device that will avoid overheating, prevent boiling of the cleaning solution and provide a continuous temperature record. **33.8.9** The owner or operator of a heated cold cleaning machine described in subsection 33.3.3.9 shall use a continuous temperature recorder, or equivalent, to indicate machine operating temperature during processing.	**33.3.3.9** If heated, the cold cleaning machine shall have a temperature control device that will avoid overheating and prevent boiling of the cleaning solution. The temperature control device shall be operated and maintained in accordance with manufacturer's recommendations. **33.8.9** The owner or operator of a heated cold cleaning machine described in subsection 33.3.3.9 shall perform a test of the temperature control system as provided by the manufacturer at least once per year and after any repairs to the temperature control system.

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
Public Workshop Comment DuPont de Nemours, Inc.	1/28/2020 2/14/2020	33.3.3.11& 33.6.7.7	The text presented some difficulty in regards to compliance with Section 33.3.3.11: "Draining or filling of solvent containers or the cold cleaning machine shall be performed beneath the solvent surface." And Sections 33.5.3.11 & 33.6.7.7: "the discharge end of the pipe shall be located beneath the liquid solvent surface." It would be impractical to comply with these conditions if the receiving container is initially empty.	For Sections 33.3.3.11, 33.5.3.11 & 33.6.7.7, the following language was added to the end of each sentence: "of the receiving container whenever possible to reduce splashing".	**33.3.3.11**Draining or filling of solvent containers or the cold cleaning machine shall be performed beneath the solvent surface. **33.5.3.11**When solvent is added to or drained from the in-line cleaning machine, the solvent shall be transferred using threaded or other leak-proof couplings and the discharge end of the pipe shall be located beneath the liquid solvent surface. **33.6.7.7** When solvent is added to or drained from the cleaning machine, the solvent shall be transferred using threaded or other leak-proof couplings and the discharge end of the pipe shall be located beneath the liquid solvent surface.	**33.3.3.11** Draining or filling of solvent containers or the cold cleaning machine shall be performed beneath the solvent surface of the receiving container whenever possible to reduce splashing. **33.5.3.11**When solvent is added to or drained from the in-line cleaning machine, the solvent shall be transferred using threaded or other leak-proof couplings and the discharge end of the pipe shall be located beneath the liquid solvent surface of the receiving container whenever possible to reduce splashing. **33.6.7.7** When solvent is added to or drained from the cleaning machine, the solvent shall be transferred using threaded or other leak-proof couplings and the discharge end of the pipe shall be located beneath the liquid solvent surface of the receiving container whenever possible to reduce splashing.
Safety-Kleen	2/13/2020	33.3.4	Commenter asked why this provision is necessary.	**The Department made no changes based on the received comment.** The Department included this provision in order to give existing sources a year to comply with the new VOC limitations proposed in subsection 33.3.7.	**33.3.4** On and after November 11, 2002, and before xx/xx/2021, ~~No~~ no person shall use, sell, or offer for sale for use in a cold cleaning machine any solvent with a vapor pressure of 1.0 millimeters of mercury (mm Hg) or greater, measured at 20ºC (68ºF) that contains volatile organic compounds.	**33.3.4** ~~On and after November 11, 2002,~~ For up to twelve months after [insert effective date], no person shall use, sell, or offer for sale for use in a cold cleaning machine any solvent with a vapor pressure of 1.0 millimeters of mercury (mm Hg) or greater, measured at 20ºC (68ºF) that contains volatile organic compounds. **33.3.7** Beginning on [insert date twelve months after effective date], the following VOC requirements for cold cleaning machines shall apply. **33.3.7.1** On and after (insert compliance date) no person shall use, sell or offer for sale for use in a cold cleaning machine any solvent containing more than 25 grams of VOC per liter in a cold cleaning machine, except as noted in subsections 33.3.7.2 or 33.3.7.3. See subsection 33.10.3 for more details.

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
Safety-Kleen	2/13/2020	33.3.4	The current language would have the effect of banning aqueous cleaning solvent, because the vapor pressure of water at 20ºC is approximately 17.5 mm g.	**The Department made no changes based on the received comment.** The Department must keep this provision intact to allow those who use the one-year compliance period to do so. Users can use aqueous solutions and solvent containing 25 g/l VOC or less (33.3.7) at any time.	**33.3.4** On and after November 11, 2002, and before xx/xx/2021, ~~No~~ no person shall use, sell, or offer for sale for use in a cold cleaning machine any solvent with a vapor pressure of 1.0 millimeters of mercury (mm Hg) or greater, measured at 20ºC (68ºF) that contains volatile organic compounds.	**33.3.4** ~~On and after November 11, 2002,~~ For up to twelve months after [insert effective date], no person shall use, sell, or offer for sale for use in a cold cleaning machine any solvent with a vapor pressure of 1.0 millimeters of mercury (mm Hg) or greater, measured at 20ºC (68ºF) that contains volatile organic compounds. **33.3.7** Beginning on [insert date twelve months after effective date], the following VOC requirements for cold cleaning machines shall apply. **33.3.7.1** On and after (insert compliance date) no person shall use, sell or offer for sale for use in a cold cleaning machine any solvent containing more than 25 grams of VOC per liter in a cold cleaning machine, except as noted in subsections 33.3.7.2 or 33.3.7.3. See subsection 33.10.3 for more details.
Public Workshop Comment DuPont de Nemours, Inc.	1/28/2020 2/14/2020	33.3.6 & 33.9.6	The terminology for "Material Safety Data Sheet" (MSDS) has changed to "Safety Data Sheet" (SDS)	The appropriate conditions were revised to reflect this change.	Used in Sections 33.3.6 and 33.9.6	New terminology used in Sections 33.3.6 and 33.9.6
Printpack	2/13/2020	33.3.3.10	The text in the WS document says in the last sentence "In addition, any liquid leak, visible tear, or crack detected shall be repaired within 48 hours immediately, or the cleaner shall be drained of all solvent and shutdown until replaced or repaired" Want the ability to isolate the leak with certain shutoff valves and continue operating until a more advantageous time for scheduled repair.	The text of 33.3.3.10 was revised in the last sentence to say " In addition, any liquid leak, visible tear, or crack detected shall be repaired immediately, or isolated such that no further leak can occur, or the cleaning machine shall be drained of all solvent and shutdown until the equipment is replaced or repaired."	**33.3.3.10**Cold cleaning machine container or containers shall be free of all liquid leaks. Auxiliary equipment such as pumps, water separators, steam traps, or distillation units, shall not have any liquid leaks, visible tears, or cracks. In addition, any liquid leak, visible tear, or crack detected shall be repaired within 48 hours, or the cleaner shall be drained of all solvent and shutdown until replaced or repaired.	**33.3.3.10**Cold cleaning machine container or containers shall be free of all liquid leaks. Auxiliary equipment such as pumps, water separators, steam traps, or distillation units, shall not have any liquid leaks, visible tears, or cracks. In addition, any liquid leak, visible tear, or crack detected shall be repaired immediately, or isolated such that no further leak can occur, or the cleaning machine shall be drained of all solvent and shutdown until the equipment is replaced or repaired.

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
National Association of Responsible Recyclers Heritage-Crystal Clean LLC Safety-Kleen	2/14/2020 2/14/2020 2/13/2020	33.3.7	The draft regulation provides for a one-year compliance period. This means that any existing installation has one year from the effective date of the amended regulation before being required to comply with the requirements of the amended regulation. We received comments that since we were switching from 100 per cent VOC to a water-based system all systems would likely need to be replaced as their current material of construction was steel which will corrode badly. Therefore, the units will have to be replaced. One commentor with up to 200 users under contract in DE, stated that they need a three-year period to meet the compliance date, not one year.	**The Department made no changes based on the received comment.** AQ agrees that cold cleaning machines may need to be replaced, but believes a one-year compliance period is adequate. The commentors produced no specific evidence to support the claim that a three-year compliance period was required. Around the year 2000, industry was required to supply over 13,000 cold cleaning machines to South Coast Air Quality Management District users in one year, with no apparent problems. Therefore, the Division believes that the construction or purchase of approximately 200 new units in one year is achievable. In addition, a delay in effective date would reduce the amount of VOC emissions realized by approximately 110 tons per year. Therefore, a two-year delay could potentially result in the emission of 220 more tons VOCs. **The specific concerns of individual commentors are addressed in more detail below.**	**33.3.7** VOC requirements for cold cleaning machines. **33.3.7.1** On and after (insert compliance date) no person shall use, sell or offer for sale for use in a cold cleaning machine any solvent containing more than 25 grams of VOC per liter in a cold cleaning machine, except as noted in subsections 33.3.7.2 or 33.3.7.3. See subsection 33.10.3 for more details.	**33.3.7** Beginning on [insert date twelve months after effective date], the following VOC requirements for cold cleaning machines shall apply. **33.3.7.1** No person shall use, sell or offer for sale for use in a cold cleaning machine any solvent containing more than 25 grams of VOC per liter in a cold cleaning machine, except as noted in subsections 33.3.7.2 or 33.3.7.3. See subsection 33.10.3 for more details.
Heritage Crystal Clean LLC	2/14/2020	33.3.7.1	Requests a three-year extension to implement the transition to aqueous solutions, as it will be required to convert existing users equipment from steel construction to plastic or stainless steel due to corrosivity in the new water environment.	**The Department made no changes based on the received comment.** Crystal-Clean provide no specific information regarding why the one-year provided in the amendments is insufficient.	N/A	N/A

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
Safety-Kleen	2/13/2020	33.3.7.1	Requests a three-year implementation period for the following reasons: (1) a required change in material of construction from steel to plastic or stainless steel due to corrosivity of water vs 100 percent VOC, (2) Safety-Kleen renegotiating supply contracts, (3) the high cost of water vs 100 percent VOC, (4) higher disposal frequency of used material with water, and, (5) the likely need for heat for some cleaning machines which also will increase costs.	**The Department made no changes based on the received comment.** The Department believes the one-year provided is sufficient to accomplish compliance with the regulation. Item (1). Safety-Kleen provided no information as to why the time period is not sufficient. We believe it can be done in the time allotted as there are many manufacturers of such equipment. Item (2) should be accomplished quickly as they must sign up new prospects in under one-year. Items (3), (4), and, (5) relate to costs which are shown to be minimal in EPA's CTG.	N/A	N/A
National Association of Responsible Recyclers	2/14/2020	33.3.7.1	Requests "…a minimum extension of three years to the implementation period to allow for an orderly transition" for the following reasons: (1) user difficulty in selecting a cleaning chemistry that works, (2) user owned equipment that was not depreciated enough to make the switch to water-based financially attractive, service contracts that needed to be renegotiated, and (3) provider difficulty in supplying new equipment with material of construction that resist the corrosivity of water.	**The Department made no changes based on the received comment.** The Department believes the one-year provided is sufficient to accomplish NORAs (1) through (3), and NORA provide no specific information as to why the one-year period is not sufficient for manufacturers to provide the needed new equipment.	N/A	N/A

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
Printpack	2/13/2020	33.3.7.3	Wanted specific pre-approved capture and control devices to be listed within the section with a specific overall control efficiency. Specifically, the thermal oxidizer that they were currently using.	AQ believes that if control devices simply need to meet the requirements of Appendix D&E, there is no need to list specific control devices within this section. In addition, we believe that requiring a control efficiency for specific devices does not ensure that the VOC limits of 25 g/l or 150 g/l are guaranteed to be met; as solvent cleaning processes and solutions vary greatly from facility to facility. AQ added language that would authorize the use of a capture and control device that would control emissions to at least 25 g/l or 150 g/l. We also removed the language that required a DNREC approved capture and control device, which implies a list of DNREC approved devices is available. Since every facility is different, the facility simply must be able to show that the device meets the requirements of Appendix D&E.	**33.3.7.3** A cold cleaning machine may use greater than the VOC content for cold cleaning machines as specified above (25 g/l or 150 g/l) by using a DNREC approved VOC capture and control device (see subsection 33.11.5). **33.11.5** If a VOC emissions capture and control system is required or used as an alternative compliance method to comply with subsection 33.3.7.3, the procedures shown in Appendix D "Emission Capture and Destruction or Removal Efficiency and Monitoring Requirements" of 7 DE Admin. Code 1124 and Appendix E "Determining the Destruction or Removal Efficiency of a Control Device" of 7 DE Admin. Code 1124 shall be followed.	**33.3.7.3** A cold cleaning machine may use greater than the VOC content for cold cleaning machines as specified above (25 g/l or 150 g/l) by using any of the VOC capture and control devices that control VOC air emissions to no more than would be experienced if the cleaning solution were VOC compliant in absence of the capture and control device. See subsection 33.11.5 for more details. **33.11.5** If a VOC emissions capture and control system is required or used as an alternative compliance method to comply with subsection 33.3.7.3, the procedures shown in Appendix D "Emission Capture and Destruction or Removal Efficiency and Monitoring Requirements" of 7 DE Admin. Code 1124 and Appendix E "Determining the Destruction or Removal Efficiency of a Control Device" of 7 DE Admin. Code 1124 shall be followed.
Public Workshop Comment Safety-Kleen DuPont de Nemours, Inc.	1/28/2020 2/13/2020 2/14/2020	33.10.3	Asked that we remove the requirement in Section 33.10.3 that the bill of sale or other document attesting to the VOC content of product sold require a signature.	The word "signed" has been removed from Section 33.10.3.	**33.10.3** Obtain from any person from whom they purchase or obtain any solvent containing VOC for use in a cold cleaning machine, a signed document specifying the following accurate information specific to all purchased or obtained product:	**33.10.3** Beginning on [insert date twelve months after effective date], obtain from any person from whom they purchase or obtain any solvent containing VOC for use in a cold cleaning machine, a document specifying the following accurate information specific to all purchased or obtained product:
National Association of Responsible Recyclers Heritage-Crystal Clean LLC Safety-Kleen	2/14/2020 2/14/2020 2/13/2020	NA (RFA-IS Form)	The proposed regulation changes, specifically the change from 100% VOC to 25 g/l VOC, will instill substantially increase annual costs for operators of cold cleaning devices, many which of are small businesses.	AQ revised its RFA-IS form to include a analysis of annual costs to small businesses. The analysis shows that overall there might be a minimal cost when switching from using high-VOC to low-VOC solvents. But in some cases, users switching can see a decrease in their annual costs, depending on the type of solvent used.	NA	NA

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
Heritage Crystal Clean LLC	2/14/2020	N/A	Recommends Delaware adopt industry exemptions included in SCAQMD rules.	**The Department made no changes based on the received comment.** There are no exemptions in the current regulation and no specific exemptions were requested at the workshops. The proposed regulation allows for control devices to be used in processes where a solvent with more than 25 g/l VOC may be needed.	N/A	N/A
National Association of Responsible Recyclers	2/14/2020	N/A	Requests "…a more robust set of exemptions to the rule. There are many specific industry sectors not included in this rule that have various limitations that prevent their use of aqueous cleaning technologies".	**The Department made no changes based on the received comment.** There are no exemptions in the current regulation and no specific exemptions were requested at the workshops. The proposed regulation allows for control devices to be used in processes where a solvent with more than 25 g/l VOC may be needed.	N/A	N/A
Heritage Crystal Clean LLC	2/14/2020	N/A	Proposed changes may result in a switch to high VOC containing hand-held solvent cleaners. Therefore, Heritage requests a ban on certain types of hand-held solvent cleaner cans or spray bottles.	**The Department made no changes based on the received comment.** Hand-held solvent use would increase user costs. Therefore, it is unlikely that users would switch to hand-held solvent. Therefore, a ban is not required to keep users from substituting high-cost spray cans for lower-cost water-based cleaning solutions.	N/A	N/A
Public Workshop Comments	1/28/2020	N/A	Commenter stated that other states do not have this regulation, that it's going above and beyond.	**The Department made no changes based on the received comment.** The Department believes the proposed amendments are necessary to help improve ground-level ozone (smog) in Delaware, as we are currently in non-attainment of the ozone national ambient air quality standard. The proposed amendments are expected to result in the reduction of approximately 110 tons of VOC per year.	N/A	N/A

Interested Party	Date	Condition(s)	Summary of Comment	AQ RESPONSE	Workshop Language	Proposed Language
Safety-Kleen	2/13/2020	N/A	Requests amendments consider the cost of adding a rinse cycle to remove unwanted residues.	**The Department made no changes based on the received comment.** We agree rinsing may be required for certain precision cleaning such as medical devices, particularly implantable ones. Very few to none of such device cleaning is used in cold solvent cleaning in Delaware. Some precision cleaning is done with vapor phase cleaning with special solvents under special conditions. These amendments do not substantially impact vapor cleaning machines.	N/A	N/A